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Tropospheric Chemistry from Space: Highlights from the EOS Tropospheric Emission Spectrometer

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While tropospheric ozone is only about 10% of the total amount of ozone present in the Earth atmosphere, it is nevertheless exceedingly important for the multiple roles it plays. However, the global height resolved distribution of ozone in the troposphere is largely unknown. The launch on July 15, 2004, of NASA's third of the Earth Observing System (EOS) series, the Aura observatory, carried with it the Tropospheric Emission Spectrometer (TES). This cooled infrared Fourier transform spectrometer was designed and built by JPL to provide the first global data sets of height profiles of tropospheric ozone and carbon monoxide. This talk will describe some of the new results and insights that utilize TES measurements. Topics will include constraints on carbon dioxide fluxes derived from TES CO2 measurements, the use of satellite data to aid in building urban air pollution budgets, quantifying the greenhouse impact of tropospheric ozone, and how water vapor isotope measurements add to our understanding of the global hydrological cycle. We will also discuss other species we measure, such as methane, ammonia, and methanol.